the circle. The succeeding divisions, to the sixteenth, are all made in the same manner. In the next place, the error of the second bisectional dot is to be set off by the micrometer head of the first microscope; and the contemporaneous coincidence of this dot, with that of the seventh of the succeeding small divisions of the sector, is to be observed, and then the sector must be moved backwards upon its axle sixteen divisions; so that it will have to move forward again by the motion of the circle one eighth of a division before the seventeenth division upon the circle is to be cut. The succeeding divisions follow in due course to the thirty-second, when allowance must be again made for the known error of the third dot, and the work proceeds in the same manner to the completion of the circle.

In the application of this method to the instrument now constructing for the Royal Observatory, which is to be divided on its edge, instead of having the divisions upon the face of the instrument, nothing new in principle is requisite, but merely a new position given to the roller, and other apparatus employed; but as that instrument may deserve a particular description, the author hopes to have an opportunity of giving an account of its construction, to the Society, at no very distant period.

A Letter on a Canal in the Medulla Spinalis of some Quadrupeds. In a Letter from Mr. William Sewell, *to* Everard Home, *Esq. F.R.S.* Read December 8, 1808. [*Phil. Trans.* 1809, *p.* 146.]

The canal, which is the subject of this letter, appears to have been discovered by the author in the year 1803, although no account has been given of it till the present description was drawn up at the request of Mr. Home.

From the extremity of the sixth ventricle of the brain in the horse, bullock, sheep, hog, and dog (which corresponds to the fourth ventricle in the human subject), a canal passes in a direct course to the centre of the spinal marrow, and may be discovered in its course by a transverse section of the spinal marrow in any part of its length, having a diameter sufficient to admit a large-sized pin; and it is proved to be a continued tube, from one extremity to the other, by the passage of quicksilver in a small stream in either direction through it.

This canal is lined by a membrane resembling the tunica arachnoidea; and it is most easily distinguished where the large nerves are given off in the bend of the neck, and at the sacrum.

A numerical Table of elective Attractions; with Remarks on the Sequences of double Decompositions. By Thomas Young, *M.D. For. Sec. R.S.* Read February 9, 1809. [*Phil. Trans.* 1809, *p.* 148.]

The attempts that have been made by some chemists to represent the attractive forces of chemical bodies by number, having been limited and hastily abandoned, some important consequences which

follow, from the principle of numerical representation, have been entirely overlooked.

Although there may be circumstances that will occasion exceptions to general rules, it appears that 100 numbers may be made correctly to represent nearly all the phenomena of the mutual action of 100 different salts, which, if described separately, would require about 5000 separate articles.

The author, having lately paid much attention to some of the principal facts in chemistry and pharmacy, has attempted the investigation of a series of numbers adapted to this purpose, and has succeeded in representing nearly 1500 cases of double decomposition enumerated by Fourcroy, with the exception of not more than twenty cases; and although it cannot be expected that these numbers are accurate measures of the forces they represent, yet they may be supposed to be tolerable approximations; for if any two of them be near the truth, the rest cannot be very far from it.

Dr. Young, however, observes, that if attractive force, which tends to unite any two substances, may always be represented by a constant quantity, it will follow, upon general principles, independent of any further hypothesis, that all known facts on this subject may be arranged in an order not liable to further alteration, in such a manner as to enable us to compare, with facility, a multitude of scattered phenomena. For if each force be constant, it follows that there must be a sequence in simple elective attractions, and palpable errors may thereby be detected in the common tables; for instance, in the four compounds resulting from the union of phosphoric and sulphuric acids with magnesia and ammonia, either the order of the acids, or the order of the bases, must be the same, otherwise the same force may be shown to be both greater and less than another.

The author observes, secondly, that there must be an agreement between the simple and double elective attractions; for if fluoric acid stands above the nitric under barytes, and below it under lime, the fluate of barytes cannot decompose nitrate of lime.

The author makes a third observation (which is less obvious), that there must be a continued sequence in the order of double elective attractions, and accordingly that between any two acids the several bases may be arranged in such an order, that any two salts will decompose each other, unless each acid be united to that base which stands nearest to it in the series; and a similar arrangement will obtain for the acid between any two bases. In forming tables of this kind from the cases collected by Fourcroy, the author has been under the necessity of rejecting some facts that were contradictory to others; and in admitting some which were not consistent with numerical representation, he has taken care to notice such inconsistency, and by notes of interrogation, or otherwise, to mark whatever remains in doubt. For the purpose of assisting the memory in retaining so numerous a series of facts, the author has contrived to express, in fifteen Latin hexameters, as many as 1260 cases of double affinity.